



EVALUATION OF ANTIULCER ACTIVITY OF *PROSOPIS JULIFLORA* ETHANOL EXTRACT IN ETHANOL INDUCED GASTRIC ULCERATION IN RATS

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ABSTRACT

There has been much interest in herbal medicines derived from the traditional knowledge of plant pharmacology for treatment of ulcer as there are fewer side effects. In the current study the plant *Prosopis juliflora* components have been explored as a potentially effective and safer antiulcer compound. A plant which is rich in Alkaloid, Flavonoids, Tannins, Anthraquinones and Quinon are responsible for inhibition of H⁺, K⁺ ATPase, inhibition of H. Pylori growth and antioxidant activity. Twenty four wistar rats were randomly allotted to four groups (6 animals per group) Group 1 was treated with water for Injection (10 ml/kg). Group 2 was treated with Ranitidine (50 mg/kg p.o dissolved in water for Injection). Groups 3 and 4 were treated with ethanol extract of *Prosopis juliflora* (250 and 500 mg/kg p.o. respectively). One hour after pre-treatment with test compounds, all animals of all the groups were treated with absolute ethanol at a dose volume of 1 ml/animal. Macroscopic examination was carried out with the hand lens and the presence of ulcer lesions was scored. The animals treated with Ranitidine (50 mg/kg), an ethanol extract of *Prosopis juliflora* (250 and 500 mg/kg) significantly reduced the ulcer score in comparison with ethanol induced ulcer control.

Key words: Antiulcer, *Prosopis juliflora*, Ethanol extract.

INTRODUCTION

Ulcer is erosion in the lining of the stomach or duodenum which is caused by the disruptions of the gastric mucosal defense and repair systems [1]. Such factors could range from natural causes (gastric cancer), infections (H. pylori), and lifestyle (drugs like non-steroidal anti-inflammatory agents, alcohol, stress and cigarette smoking) [2]. Current treatment of ulcers in developing countries has been largely suppression of pain, with little or no strategy aimed at a cure. Recently, there has been much interest in herbal medicines derived from the traditional knowledge of plant pharmacology for treatment of ulcer as there are fewer side effects.

Many tropical herbs have been scientifically reported to possess potent antiulcer activity [3,4]. In dry regions of Karnataka we find many plants which show medicinal properties. *Prosopis juliflora*, a member of family Leguminosae, is found in arid and semi-arid regions of Karnataka. A number of compounds have also

been reported from this plant, the most common of these being steroids, tannins, leucoanthocyanidin and ellagic acid glycosides. Extracts of *Prosopis juliflora* seeds and leaves have several in vitro pharmacological effects such as antibacterial, antifungal, anti-inflammatory properties [5-7]. It has been used as a folk remedy for catarrh, inflammation, and in healing of wounds [8,9]. In the current study the plant *Prosopis juliflora* components have been explored as a potentially effective and safer antiulcer compound.

MATERIALS AND METHODS

Test Procedure and Observations

1. Twenty four Wistar rats of either sex were randomly allotted into four groups (6 per group). Group 1 was treated with Water for Injection, 10 ml/kg b.w. and served as vehicle control. Group 2 was administered with single oral dose of Ibuprofen, 100 mg/kg b.w. and served as positive control.

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2. Groups 3 and 4 were administered with single oral dose of Ethanolic extract of *Prosopis juliflora* 250 and 500 mg/kg b.w., respectively.
3. Right hind Paw size of each rat was measured before induction of inflammation and was considered as base line (0 hr reading). Inflammation was induced in rats by sub plantar injection of 0.1 ml of fresh egg-albumin into the right hind paw.
4. The paw size was measured after induction of inflammation and at 1, 2, 3, and 4 hrs.
5. Edema volume will be calculated by deducting 0 hour paw size each hour paw size.
6. Data were analyzed using one - way ANOVA followed by suitable post hoc test. P values < 0.001 will be considered as significant in comparison to control.

Husbandry Conditions

Temperature	20±3°C
Humidity	30-70 %
Light	12 hours light and 12 hours dark cycle
Air changes	12-15 changes per hour

RESULTS AND DISCUSSION

Twenty four male rats were randomly allotted to four groups (6 animals per group) and food was deprived off for 48 hours but water provided ad libitum, but before 2 hours of experiment water also withheld. The design of Anti-Ulcer Activity of *Prosopis juliflora* Ethanol Extract in Ethanol Induced Gastric Ulceration in Rats is shown in

Table 1. And Formulation Details of dose conc. of Anti-Ulcer activity has shown in Table 2. Group 1 was treated with water for Injection (10 ml/kg). Group 2 was treated with Ranitidine (50 mg/kg p.o dissolved in water for Injection). Groups 3 and 4 were treated with ethanol extract of *Prosopis juliflora* (250 and 500 mg/kg p.o. respectively). One hour after pre-treatment with test compounds, all animals of all the groups were treated with absolute ethanol at a dose volume of 1 ml/animal. One hour after ethanol administration, animals were euthanized by cervical dislocation and the stomachs were removed and opened along the greater curvature. Macroscopic examination was carried out with the hand lens and the presence of ulcer lesions was scored.

The volume 1 ml of 50% ethanol successfully induced the gastric Ulcers in rats. Reduced effect of *Prosopis juliflora* ethanol extract on ulcer score in Ethanol induced gastric ulceration rats is shown in Table 3 and graphical representation is shown in Graph 1. The animals treated with Ranitidine (50 mg/kg), ethanol extract of *Prosopis juliflora* (250 and 500 mg/kg) significantly reduced the ulcer score in comparison with ethanol induced ulcer control. And individual animal Ulcer Scores of Groups is shown in Table 4

Data was analysed using one way ANOVA (Analysis of Variance) followed by Dunnett T method as post-hoc test. All values were reported as Mean ± SEM. Statistical significance will set at $p \leq 0.001$.

Table 1. Study design of Anti-Ulcer Activity of *Prosopis juliflora* Ethanol Extract in Ethanol Induced Gastric Ulceration in Rats

Groups	Treatment	Dose(mg/kg)	No. of animals	Animal No.
G1	Water for Injection (WFI)	0(10 ml/kg)	6	1-6
G2	Ranitidine	50	6	7-12
G3	Ethanol extract of <i>Prosopis juliflora</i>	250	6	13-18
G4	Ethanol extract of <i>Prosopis juliflora</i>	500	6	19-24

Table 2. Formulation Details of Anti-Ulcer Activity of *Prosopis juliflora* Ethanol Extract in Ethanol Induced Gastric Ulceration in Rats

Treatment groups	Dose (mg/kg rat b.wt.)	Body Weights (g)	Ulcer Score
G1 Water for Injection	0 (10 ml/kg)	189.10 ± 2.41	7.00 ± 1.10
G2 Ranitidine	150	187.70 ± 2.68	2.50 ± 0.50***
G3 Ethanol extract of <i>Prosopis juliflora</i>	250	191.80 ± 2.57	1.00 ± 0.37***
G4 Ethanol extract of <i>Prosopis juliflora</i>	500	188.80 ± 2.97	1.17 ± 0.40***

Table 3. Effect of *Prosopis juliflora* ethanol extract on ulcer score in Ethanol induced gastric ulceration rats

Group	Treatment	Dose concentration (mg/ml)	Weight of test/reference item (mg)	Volume of vehicle (ml)
G1	Water for Injection (WFI)	0	0	20
G2	Ranitidine	5	100	20
G3	Ethanol extract of <i>Prosopis juliflora</i>	25	500	20
G4	Ethanol extract of <i>Prosopis juliflora</i>	50	1000	20

Values are expressed as mean ± SEM;(No. of Animals per Group) n= 6

* - Statistically significant when compared to control group ($p < 0.05$)

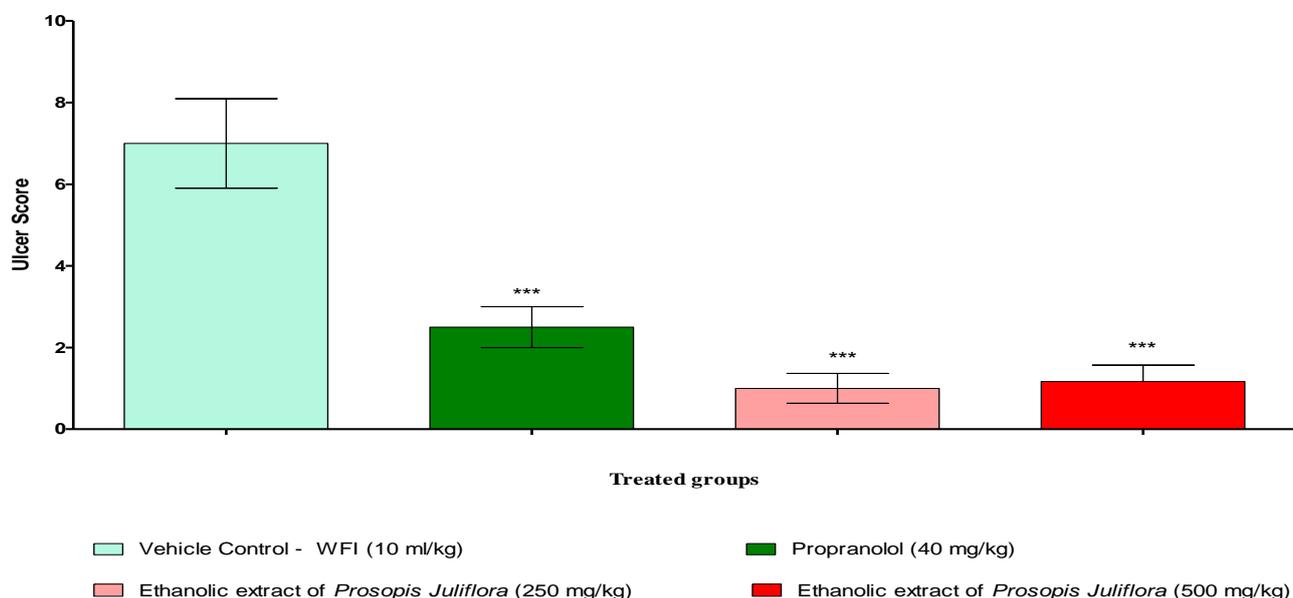
** - Statistically significant when compared to control group ($p < 0.01$)

*** - Statistically significant when compared to control group ($p < 0.001$)

Table 4. Individual Animal Ulcer Scores

Treatment Groups	Dose (mg/kg)	Animal No.	Body weight (g)	No. of Ulcers
G1 Water for Injection	0 mg/kg	1	199.25	7
		2	186.67	6
		3	187.31	4
		4	189.63	6
		5	190.49	12
		6	181.37	7
G2 Ranitidine	40 mg/kg	7	189.61	2
		8	190.01	4
		9	198.77	1
		10	183.90	2
		11	182.26	2
		12	181.41	4
G3 Ethanol extract of <i>Prosopis juliflora</i>	250 mg/kg	13	197.25	0
		14	182.23	2
		15	192.28	1
		16	192.77	1
		17	187.05	0
		18	199.12	2
G4 Ethanol extract of <i>Prosopis juliflora</i>	500 mg/kg	19	181.44	3
		20	189.36	1
		21	198.26	1
		22	196.23	1
		23	186.25	1
		24	181.15	0

Graph.: 1. Effect of *prosopis juliflora* ethanolic extract on ulcer score in ethanol induced gastric ulceration in rats



* - Statistically significant than the control group (p<0.0 5)
 ** - Statistically significant than the control group (p<0.0 1)
 *** - Statistically significant than the control group (p<0.001)

CONCLUSION

The ethanolic extract of *Prosopis juliflora* exhibits major bioactive compounds like Alkaloid, Flavonoids, Tannins, Anthraquinones and Quinon, H⁺, K⁺, ATPase

exhibits antiulcer activity and treated 250mg/kg and 500mg/kg significantly reduced the ulcer score. The effective drug may be formulated by *Prosopis juliflora* as efficient antiulcer agent.

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